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ABSTRACT

Designed to provide assistance to school district personnel who seek to develop a plan for information management and related applications of technology, this guide presents the School District Information Study (SDIS) model for the review of management policies, procedures, and activities related to information processing done by school district staff. In this model, data are gathered, needs are articulated, recommendations are developed, and a plan for implementation is produced. The study focuses on how information is processed in all sectors of the school district and on the integration of appropriate technology for managing that information. While districts can use all or part of the process, and the procedures may be altered to accommodate the unique situations in each school district, it is strongly recommended that the Regional Information Center resource person be contacted initially for guidance and consultation. The project goal is addressed in four stages which correspond to the four stages of the process: (1) planning for the study; (2) development of district needs and recommendations; (3) production of a plan; and (4) implementation of the plan. A summary of the suggested roles for participants in an SDIS is given, followed by individual listings of the 11 procedures included in the 4 stages. Each of these listings includes the person(s) involved and suggested actions. The appendices, which make up more than half of the document, include various supporting documents, forms, a questionnaire, worksheets, sample letters, and informational materials. (SD)

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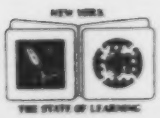
SCHOOL DISTRICT INFORMATION STUDY

PLANNING FOR THE MANAGEMENT OF INFORMATION THROUGH TECHNOLOGY



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SCHOOL DISTRICT INFORMATION STUDY

PLANNING FOR THE MANAGEMENT OF INFORMATION THROUGH TECHNOLOGY

A PLANNING AND STAFF DEVELOPMENT PROJECT

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Division of E&S Education Planning

February 1990

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PREFACE

The School District Information Study was developed as part of the Long-Range Plan for Technology in Elementary and Secondary Education in New York State. The School District Information Study is a review of management policies, procedures, and activities related to information processing done by school district staff. The study has planning and implementation stages designed to enhance the management of information through technology. The State Education Department has also developed materials that focus on the use of technology to enhance the school learning environment. These materials have been developed through the Technology Planning for Improving Schools (TPIS) model. Copies of the Long-Range Plan and TPIS information are available from the address below.

The purpose of this guidebook is to provide assistance to school district personnel who seek to develop a plan for information management and related applications of technology. The guidebook is the culmination of many discussions and meetings with local, regional, and State groups over a three-year period. An active collaboration was initiated with the Regional Information Center at Erie #1 BOCES, and field studies were conducted in the Williamsville Central School District and the Lockport City Schools. Work on this guidebook was done by personnel from the State Education Department, Erie #1 BOCES, Onondaga BOCES, and the Lockport City School District.

Progress reports were given to and assistance sought from the INET-NY policy board and the Directors of the Regional Information Centers. This guidebook is consistent with the policies pertaining to technology planning adopted by the Board of Regents at their January 1989 meeting.

Field work demonstrated the need for a guidebook to resolve the problems of:

- scale (over 700 school districts to assist Statewide),
- resources (districts have various amounts of time to spend on planning activities), and
- constraints (availability of planners locally and regionally).

Thus, based on the process that evolved, this guidebook was developed with suggestions from individuals representing several key sectors of education in New York State. This is not a final product but rather a dynamic document that will change with the evolution of the process. Please send any written comments or suggestions to:

Michael S. Radlick, Director, Division of Elementary and Secondary Education Planning, New York State Education Department, Room 867 EBA, Albany, NY 12234.

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THE SCHOOL DISTRICT INFORMATION STUDY MODEL

The School District Information Study model is a review of management policies, procedures, and activities related to information processing done by school district personnel. In this model, data are gathered, needs are articulated, recommendations are developed, and a plan for implementation is produced. The study focuses on how information is processed in all sectors of the school district and on the integration of appropriate technology for managing that information.

The strength of the model is the completion of a study, individualized to the wants and needs of the school district. The collaboration and participation of the school district personnel results in ownership and provides concrete benefits including expanded knowledge of technology and identification of information and staff development needs, as well as, careful documentation.

This guidebook provides procedures and activities for completing a School District Information Study. School districts have options in using this guidebook. They can take as little or as much time in going through the process as required. They can use a local person to act as the facilitator or they can use a BOCES or Regional Information Center resource person. They can use all of the process or parts of the process, and the procedures are flexible and may be altered to accommodate the unique situations in each school district. These are all local judgments meant to give flexibility and to recognize the individual needs, resources, and constraints of different school districts. **It is strongly recommended that the Regional Information Center be contacted initially for guidance and consultation.**

The outline that follows depicts the relationship between the components of the study process and, in turn, the guidebook. The project goal is addressed in four stages which are comprised of 11 procedures. The roles of participants are presented independently, and supporting documents, forms, sample letters, and informational materials are presented in the appendices.

OUTLINE OF THE

SCHOOL DISTRICT INFORMATION STUDY PROCESS

The Goal: To develop a school district plan for information management.

Stages: Four stages for (I) Planning for the study, (II) Development of district needs and recommendations, (III) Production of a plan, and (IV) Implementation of the plan..

Participants:

Board of Education
Superintendent
Study Team Contact Person
Study Team Member
Facilitator
District and RIC Implementation Persons
Technical Advisor(s)

The Stages and Procedures:

PLANNING

1. Describing the Study Process to Interested School District(s)
2. Organizing the Study with the Participating District
3. Planning for Data Gathering with the District Study Team

DEVELOPMENT

4. Gathering and Organizing, School District Data
5. Analyzing and Specifying Problems of the School District
6. Developing Recommendations for Using Technology For the Management of Information
7. Writing a Summary Report on the Process and Findings of the Study

PRODUCTION

8. Producing an Implementation Plan Based on the Summary Report
9. Presenting the Final Report and Implementation Plan to various Audiences

IMPLEMENTATION

10. Implementing the Plan
11. Monitoring and Evaluation

Supporting Documents

Appendices

PARTICIPANTS

SUMMARY OF SUGGESTED ROLES IN A SDIS

Board of Education

- *endorses study*
- *reviews implementation plan*
- *acts on recommendations*
- *creates policy as appropriate*

Superintendent

- *initiates study*
- *charges Study Team*
- *provides time and other resources to Study Team*
- *sanctions appropriate requests of Study Team*
- *reviews Study Team's recommendations*
- *informs Study Team of decisions*
- *acts as liaison to Board of Education*

Study Team Contact Person

- *acts as liaison with facilitator and team*
- *acts as liaison with Superintendent and team*
- *acts as liaison with Superintendent and facilitator*

Study Team

- *collects information from district staff*
- *analyzes concerns and needs of district*
- *considers alternative solutions*
- *makes recommendations*

Facilitator

- *keeps team on task*
- *acts to coordinate study and provision of technical information*
- *leads study processes*

District and RIC Implementation Persons

- *act on implementation plan*
- *report progress to Superintendent/Director*

Technical Advisor(s) Regional Information Center, Board of Cooperative Educational Services, New York State Education Department

- *provide appropriate information and assistance*

PROCEDURES

The following procedures are provided as guides. They may be adapted as necessary to meet local needs. It is assumed that the Superintendent will arrange a meeting with the Regional information Center to examine the feasibility of doing a School District Information Study.

PLANNING

PROCEDURE 1: Describing the Study Process to Interested School District(s)

PERSON(S)	ACTION
Board of Education	1. Endorses undertaking a study.
Superintendent	2. Convenes meeting.
Regional Information Center Staff Person	3. Presents overview of School District Information Study (SDIS) Model, Process, Procedures, and Support. See: Appendix 1 (What is a School District Information Study?)
	4. Presents Appendix 2 to Superintendent, for review of the inventory instrument. See: Appendix 2 (A Strategic Decision: Technology For Information Management). Determines feasibility of a study and resources required.
Superintendent	5. Determines level of commitment.
Regional Information Center Staff Person	6. Presents options for selecting a facilitator for SDIS from: a. Regional Information Center b. Local BOCES c. Cross contract with BOCES other than a local BOCES d. BOCES Regional Planning Unit. **It is strongly recommended that the Regional Information Center be**

informed throughout the process.

State Education Department Staff

7. Presents role of Regional Information Center (RIC) and the State Education Department in Technology Network Ties (TNT).

   See: Appendix 3 (TNT Update).

PLANNING

PROCEDURE 2--Organizing the Study with the Participating District

PERSON(S)	ACTION
Facilitator	1. Meets with Superintendent to discuss the upcoming study to determine: a. constraints b. time factors c. roles of district staff, BOCES, Regional Information Center staff, State Education Department staff and others. d. unique local circumstances e. aspirations of district. 2. Contacts appropriate personnel outside the district to discuss technical assistance from: a. BOCES b. Regional Information Center c. State Education Department d. other sources. 3. Develops letter of understanding to be shared with Superintendent. See: Appendix 4 (Letter of Agreement).

Superintendent

4. Identifies district Study Team members.

5. Sets date to convene Study Team and begin study.

6. Prepares and forwards letter to Study Team members.

7. Assigns support staff to assist Study Team.

PLANNING

PROCEDURE 3--Planning Data Gathering with the District Study Team

PERSON(S)	ACTION
Superintendent	1. Presents overview of district status, concerns, and aspirations to Study Team at first meeting.
	2. States commitment to allocate staff time to study information management.
	3. Introduces, RIC, BOCES, and SED participants.
Facilitator	4. Presents overview of study process to Study Team. See: Appendix 5 (Study Components Diagram).
State Education Department Staff	5. Presents overview of TNT, Regents policies, and forms of technical assistance. See: Appendix 3 (TNT Update). See: Appendix 6 (TNT Configuration Diagram). See: Appendix 7 (Regents Policies).
Facilitator	6. Leads Study Team through development of mission statement. See: Appendix 8 (Mission Statement).
	7. Leads Study Team through identification of:

a. functional groups* to be interviewed
b. individuals to be placed in each group
c. schedule of interviews.

See: Appendix 9 (List of Functional Groups).
See: Appendix 10 (Placing Individuals in Functional Groups).

8. Explains the interview process to Study Team.

9. Develops flowchart with time line with Study Team's input.

Superintendent

10. Chooses member of Study Team to be team leader and contact person with Facilitator.

11. Distributes questionnaire with a cover letter endorsing the study and requesting responses to the questionnaire and participation in the interviews.

See: Appendix 11 (Questionnaire).

*Functional groups are individuals who perform similar tasks (e.g., central administration, principals, teachers, transportation, maintenance).

DEVELOPMENT

PROCEDURE 4--Gathering and Organizing School District Data

PERSON(S)	ACTIONS
Facilitator	1. Receives and tallies staff questionnaires from district.
	2. Groups the questionnaires by job/functional group (i.e., central administration, principals, teachers, transportation, maintenance, etc.).
	3. Conducts a frequency analysis for each functional group on the number of responses for each item on the questionnaire.
	4. Identifies any trends within and among groups. Anomalies may require further investigation.
	5. Formulates questions to be used in the interviews.
Study Team Contact Person	6. Schedules interviews.
Interview Team Leader	7. Explains the purpose of the Study and the interview process to each group to be interviewed. See: Appendix 1 (What is a School District Information Study?).
	8. Assigns interview Team Recorder.
	9. Uses data from questionnaires to guide the interviews.

Interview Team Recorder

10. Keeps notes on easel or board.

11. Records declarative statements when consensus is reached on a problem.

12. Transfers declarative statements of problems to Interview Questions Form.

    See: Appendix 12 (SDIS Interview Questions).

Interview Team Members

13. Ask questions of each group, guided by schedule of questions, questionnaire data, and leads developed during interviews.

14. Reach consensus on statements of problems after each interview.

Facilitator

15. Places statements of problems into various categories of concern such as hardware, software, communications, procedures, training, centralized data base.

    See: Appendix 13 (Summary of Steps Leading to the Development of Recommendations).

16. Shares categorization of problem statements with Study Team.

17. Arranges field trips and presentations as appropriate with:
    a. Regional Information Center
    b. State Education Department
    c. Vendors.

DEVELOPMENT

PROCEDURE 5--Analyzing and Specifying Problems of the School District

PERSON(S)	ACTION(S)
Facilitator	1. Reviews progress with team members.
	2. Reviews categorization of statements of problems with team. Makes appropriate changes as necessary.
Study Team	3. Identify key issues within each category of concern.
	4. Cluster statements of problems which support each key issue within categories of concern. See: Appendix 13 (Summary of Steps Leading to the Development of Recommendations).
	5. Analyze concerns, issues, and supporting problem statements.
	6. Write a short paragraph or sentence summarizing each analysis. See: Appendix 13 (Summary of Steps Leading to the Development of Recommendations).

DEVELOPMENT

PROCEDURE 6--Developing Recommendations for Using Technology for the Management of Information

PERSON(S)	ACTION(S)
Facilitator	1. Arranges inservice for Study Team on technological solutions.
	2. Leads Study Team in deriving general recommendations from each analysis.
Study Team	3. Comes to consensus and summarizes recommendations.
	See: Appendix 13 (Summary of Steps Leading to the Development of Recommendations).

DEVELOPMENT

PROCEDURE 7--Writing a Summary Report on the Process and Findings of the Study

PERSON(S)	ACTION(S)
Facilitator	1. Reviews study process and findings with Study Team including: a. questionnaire b. interviews c. statements of problems d. categories of concern and key issues e. analysis and synthesis f. recommendations.
Study Team	2. Decides on report format. 3. Identifies individual(s) to write report.

PRODUCTION

PROCEDURE 8--Producing an Implementation Plan Based on the Summary Report

PERSON(S)	ACTION(S)
Facilitator	1. Reviews report with RIC staff.
Regional Information Center Staff	2. Develops a multiphased proposal based on recommendations including: a. timeline b. staffing c. training d. implementation monitoring e. hardware and software configuration f. estimated costs.
	3. Meets with Superintendent to review study process and recommendations of the report.
Superintendent	4. Reviews and modifies proposal.
Regional Information Center Staff	5. Modifies proposal as necessary.
	6. Creates implementation plan based upon superintendent's modifications and decisions regarding proposal.
Superintendent	7. Endorses plan.

PRODUCTION

PROCEDURE 9--Presenting the Final Report and Implementation Plan to Various Audiences

PERSON(S)	ACTIONS
Superintendent	1. Reviews Implementation Plan with Study Team in conjunction with final report and recommendations.
Facilitator/Regional Information Center Staff	2. Provides services in presenting Final Report and Implementation Plan to the Board, the public, the press, and other audiences as requested.
Superintendent and Study Team	3. Present study report, recommendations, and Implementation Plan to the Board of Education for approval.

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IMPLEMENTATION

PROCEDURE 10--Implementing the Plan

PERSON(S)	ACTION(S)
Board of Education	1. Acts on Implementation Plan.
	2. Adopts board policy statements related to Implementation Plan as appropriate.
Superintendent	3. Designates district implementation person.
	4. Arranges for implementation person to meet with RIC counterpart.
District and RIC Implementation Persons	5. Meet to review Implementation Plan and to schedule appropriate activities for upcoming 3 month period.
	6. Meet with appropriate persons in district and BOCES to initiate scheduled activities.

IMPLEMENTATION

PROCEDURE 11--Monitoring and Evaluation

PERSON(S)	ACTION(S)
District and RIC Implementation Persons	1. Elicit opinions and reactions from district staff and District Study Team members and report to the Superintendent and appropriate RIC staff at the end of each three-month period.
	2. Meet with the Study Team at the end of each six-month period to report on progress.
Superintendent	3. Keeps Board of Education informed and involved as appropriate.
Board of Education	4. Develops necessary policy as appropriate.

APPENDICES

VARIOUS SUPPORTING DOCUMENTS

WHAT IS A SCHOOL DISTRICT INFORMATION STUDY?

A School District Information Study (SDIS) is a way to find out how the staff of the school district presently work with information and the ways in which technology could be used to enhance school district management of information. The Study results in a multi-phase implementation plan for training, hardware, and software.

A study team comprised of key district personnel is appointed by the Superintendent to conduct the study from beginning to end. The key activities of the study team include:

- *Gathering information through inventories, questionnaires, and interviews.*
- *Analyzing information to identify needs.*
- *Participating in various in-service activities to support the study.*
- *Developing a comprehensive report of the process, findings, and recommendations for the school district.*

A study can take from three to nine months and involves 5 to 10 days of staff time per study team member.

A completed study provides information from key sectors of the school district, a systematic needs analysis, and an implementation plan citing specific equipment, software and training requirements. Through the implementation plan, the district is able to match its present and anticipated needs with the available technology.

There is technical assistance available. The Study Team can be assisted by Regional Information Center personnel and State Education Department staff. For additional information contact: Your Regional Information Center Director or Michael Radlick (518) 473-9106.

APPENDIX 2

A STRATEGIC DECISION: TECHNOLOGY FOR INFORMATION MANAGEMENT

PREFACE

The State Education Department believes that the acquisition by a school district of any computer technology for school management is a strategic decision, a decision that calls for careful planning. The Department also believes that the chief school officer is the critical individual in this strategic decision. When a school district is considering purchase of computer technology, the superintendent is the one who must take steps to assure that decisions are based on thorough, system-wide planning efforts.

This booklet is intended to start chief school officers thinking about such planning. It describes some of the problems inherent in acquiring computer technology and pinpoints some key considerations in planning.

Planning requires a considerable commitment of time by the chief school officer as well as staff, but the process can result in the acquisition, at the most reasonable cost possible, of computer equipment and software that will meet the needs of the school district now, and for some time into the future.

WHY PLAN FOR COMPUTER PURCHASE?

School officials need to plan carefully for computer purchases because:

- **Computers are expensive.**
- **The products purchased will shape the district's operations.**
- **Undoing mistakes will be costly.**
- **Well planned information systems can improve management productivity and ultimately lead to more effective instructional programs.**

WHAT KINDS OF MISTAKES ARE MADE IN COMPUTER ACQUISITION?

Some of the common, costly mistakes made in the acquisition of computer equipment and software applications are:

- **Financial**
- **Technological**
- **Strategic**

FINANCIAL MISTAKES

- Focusing on the price of the main piece of hardware, be it mainframe, minicomputer, or microcomputer, and not including the cost of necessary auxiliary equipment as well as software and staffing.

- Failing to consider a vendor's track record including the reliability of the product and the availability of local personnel to support hardware and software maintenance.

- Purchasing technology to serve a single purpose rather than considering all key functional applications.

- Becoming overly impressed with software applications and not considering carefully the cost of supporting the system.

TECHNOLOGICAL MISTAKES

- Ignoring the desirability of an integrated database among functional applications and compatible hardware.

- Purchasing hardware without considering the availability of adequate software for multiple purposes.

- Acquiring equipment and software without considering who will manage the system, provide maintenance in case technical problems occur, make enhancements to meet changing requirements, and offer necessary training.

STRATEGIC MISTAKES

- Failing to consider the desirability of networking at the regional and State level via Technology Network Ties.
- Failing to consider the provision of regional and State services by a BOCES Regional Information Center.
- Failing to consider whether software meets State and Federal reporting requirements.

HOW BIG DOES AN ACQUISITION NEED TO BE BEFORE YOU SHOULD CONSIDER A PLAN?

Some sort of a plan is needed if you are considering any of the following:

- **Purchasing a single computer for an individual.**
- **Purchasing several computers and accessories for individual offices.**
- **Purchasing a computer system for the entire district.**
- **Replacing existing computer hardware.**
- **Acquiring software for various applications.**
- **Purchasing outside computer services.**
- **Developing a local area network.**

HOW DO YOU START PLANNING FOR COMPUTER ACQUISITION?

Studying how the school district uses information is the best way to start planning for computer acquisition. Systematic study should assure consideration of:

- **Hardware**
- **Software**
- **Personnel**
- **Services**
- **Configurations**
- **Support**

WHO SHOULD BE INVOLVED IN PLANNING?

The three key groups that should be involved in planning computer acquisition are:

- Decision Makers
- Information Handlers
- Policy Makers

ARE YOU READY?

Now that you're more aware of the pitfalls and pressures that can accompany computer acquisition, here is an inventory that will help you get a further sense of what a thorough study will require. This inventory will help you gauge the extent of your commitment to a planning study.

GETTING STARTED:
AN INVENTORY FOR THE SCHOOL ADMINISTRATOR

Here are some questions to be answered before a computer study is undertaken. Place an X on the continuum that describes the level of your readiness for action.

HOW PREPARED ARE YOU TO:	Not Prepared	Very Prepared
1. Develop a philosophy of purpose and a mission statement to guide the study?	0	1 2 3 4
2. Conduct an inventory of existing hardware and its uses?	0	1 2 3 4
3. Conduct an inventory of information collection, processing, and use in each office under your supervision?	0	1 2 3 4

ARE YOU PREPARED TO:		Not Prepared	Very Prepared
4.	Study and document your staff's involvement with creating information, communicating information, administering information, and analyzing information?	0____1____2____3____4	
5.	Assign a team to survey and interview other staff in each office?	0____1____2____3____4	
6.	Commit this team to often lengthy discussions of the findings to identify needs and potential problems?	0____1____2____3____4	

	ARE YOU PREPARED TO:	Not Prepared	Very Prepared
7.	Talk to consultants, vendors, and others to learn what is available to meet your needs?	0____1____2____3____4	
8.	Make a commitment to the findings of your study in developing recommendations to your Board of Education?	0____1____2____3____4	
9.	Conduct a survey to determine additional information needs for management in the various offices?	0____1____2____3____4	

ARE YOU PREPARED TO:	Not Prepared	Very Prepared
10. Commit considerable staff time to the study?	0	1 2 3 4

INVENTORY RESULTS

The results should tell you how ready you are to undertake a systematic study for computer acquisition. If they suggest you are not ready, they should also suggest what needs to change in order to achieve a sound computer purchasing program and develop an effective information system for your district.

This booklet was developed cooperatively by:

- The New York State Education Department, Office of Planning, Testing and Technological Services
- Erie 1 BOCES
- The Regional Information Centers of New York State

It is endorsed by the management team of the School Computer Network of New York State.

APPENDIX 3

TNT UPDATE

Technology Network Ties

April 1989

A SYSTEM FOR GENERATING SOLUTIONS AND MAXIMIZING RESOURCES

The Purpose

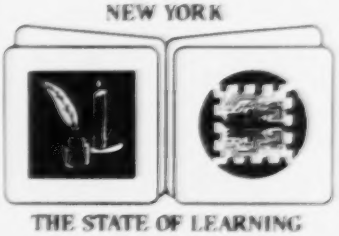
Technology Network Ties (TNT) is an extensive statewide program integrating computer hardware, software and communications technologies in a comprehensive network linking school districts, BOCES, libraries and other educational agencies with the State Education Department.

TNT is built on the premise that New York State's leadership in education must be built around the present and future capabilities of information technology, particularly communications network and database technology. The TNT technology infrastructure is not an "end," but a "means." The Technology Network Ties infrastructure needs to be understood as a utility, available to educators when they need it — much as the telephone system. The goal of the TNT infrastructure is to support the teaching/learning environment. Ultimately the technology must be there and available to us to do our jobs — helping to educate students.

The State of New York, through the offices of the State Education Department, is the only organization in a position to effect the kind of planning, standard setting and monitoring necessary to build the Technology Network Ties infrastructure. This infrastructure is bringing about the integration of information systems in a wide variety of educational institutions, as well as the more effective use of technology within schools.

Without substantial capital investments in a program such as Technology Network Ties, the State of New York would face increasing duplication of effort in system building, proliferation of incompatible systems, increasing costs and the embarrassment that a laissez faire approach would produce for State leaders. The ultimate effect of such an approach on educational programs would be catastrophic. The Education Department, through the Technology Network Ties program, has provided the vision and leadership necessary to avoid these problems.

Technology has value when it enhances management and instructional functions that support the overall goals of education. The Governor and Legislature have invested in the TNT infrastructure because it provides critical benefits at all levels of the State system. The infrastructure is now in place and the benefits are beginning to be realized. However, the potential uses and benefits of the TNT infrastructure will far exceed current operations and capabilities. **The Technology Network Ties program provides the means for generating solutions to serious educational problems while maximizing and sharing resources that are in critically short supply.**



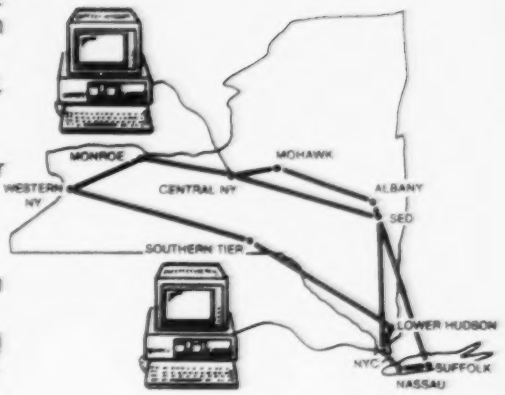
The Challenge

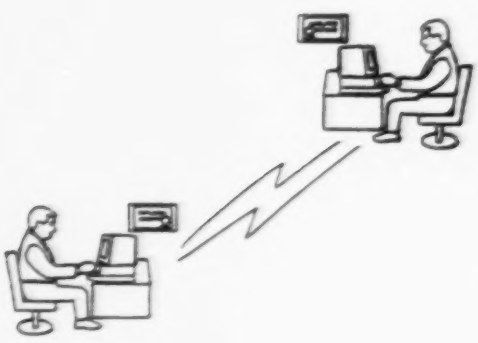
There are no "quick fixes" for the challenges being presented to the New York State educational system. The effective integration and use of technology within schools require comprehensive planning and bold leadership across the entire State. **The scope and complexity of the challenges required to implement and build upon the Technology Network Ties infrastructure also require extended time and resources to bring into being the benefits the system is capable of delivering.**

The Benefits

STATEWIDE NETWORK INFRASTRUCTURE

- Can interconnect all school districts, Boards of Cooperative Educational Services (BOCES), libraries and State Education Department (SED)
- Designed for use at all educational levels (classroom, building, district, region, State)
- Establishes common databases (permits local flexibility)
- Establishes standards and protocols for data collection and for communications
- Provides current information for decision making
- Provides for quick, easy sharing of information
- Provides increased information processing and communication services at reduced costs
- Provides access to specialized information services (e.g., Youth-At-Risk)
- Provides long-term planning platform for school districts and BOCES
- Encourages joint planning and sharing of resources





ELECTRONIC COMMUNICATIONS

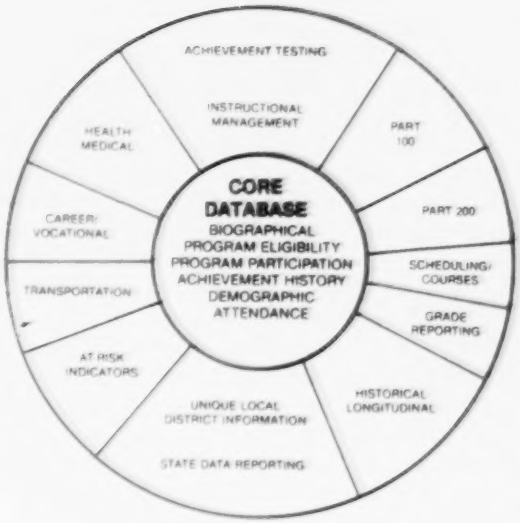
- Immediate transmittal of memos, letters, bulletins, reports and documents
- Immediate communication between all buildings, school districts, BOCES, libraries and the State Education Department
- Immediate communication between two individuals, among several individuals (conferencing), from one individual to a select list or network-wide
- Automated calendars and scheduling permit personal, building, district, regional and statewide schedules

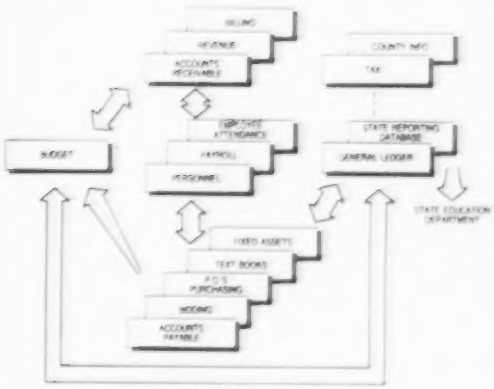
INSTRUCTIONAL PROGRAMS

- Model Schools Program has demonstrated the extent to which computer technology can improve effectiveness and efficiency of instruction and influence curriculum development, school organization and operation
  - Desktop Publishing
  - Telecommunications for teachers and students
  - Interactive videodisc use in the classroom
  - Use of computer for Special Education
  - CIMS mathematics and science instructional support
  - CIMS reading and writing instructional support
  - Individual learning activities developed for Computer Education Curriculum
- Interactive Distance Learning Projects will be integrated into statewide network
- Electronic communication system encourages and supports joint curriculum development and sharing
- Instructional databases made available to help students expand their research/information processing skills

NEW STUDENT INFORMATION SYSTEM

- Will address multiple levels of need ranging from school building, to district office, to regional, and to the State (SED, Legislative and Executive policy level)
- Will provide more accurate, complete and timely information for decision makers relative to instruction, programs and student performance
- Will provide flexible access to data for ad hoc reports and downloading to district computers
- Will reduce data collection tasks imposed on teachers and principals
- Will track and support student transfers in accurate and timely manner
- Will include the following kinds of information: biographical, attendance, academic, course scheduling, program participation, instructional management and health/medical
- Will include a comprehensive component to manage student educational plans, course requirements and graduation requirements (Regents Action Plan - Part 100)
- Will include a comprehensive component to manage the administrative and programmative responsibilities of special education. Components include CSE processing, IEP generation, event tracking, document generation, placement, and state reporting (Part 200)
- Common system being developed for all schools in New York State, including New York City, the other Big Five City schools and schools served by BOCES Regional Information Centers



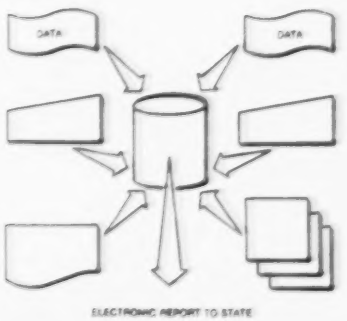


NEW FINANCIAL MANAGEMENT SYSTEM

- Will provide greater flexibility to school districts as well as common data for State reporting
- Will maintain and provide information in more timely manner for decision makers
- Will provide flexible access to data for ad hoc reports and downloading to district computers
- Will automatically meet State Education Department requirements and generate required reports; thereby reducing paperwork
- Comprehensive design that integrates data within and across years includes payroll, personnel management, attendance/leave accounting, accounts payable, budgeting, bidding, purchasing, accounts receivable, general ledger and fixed assets

SIMPLIFIED DATA COLLECTION AND PROCESSING

- Data entered once reduces costs and errors of multiple records
- Data collection becomes a by-product of daily processing activities
- Required reports automatically generated from database
- Data retrieval simple and available in multiple formats providing flexible access
- Data may be maintained (stored) electronically and printed in paper form only when required
- Required State data reported electronically from school districts to Regional Information Centers to the Education Department via the TNT network



The Accomplishments

The Technology Network Ties Program funding umbrella comprises the following related programs: Student Information System (SIS), the Model Schools Program (MSP), Distance Learning, and the Comprehensive Instructional and Management System (CIMS). Listed below is a summary of some of the major accomplishments of TNT during the past school year. The accomplishments are grouped together into four major categories: Infrastructure, Management, Instructional Support and Instruction.

INFRASTRUCTURE

1. **The statewide TNT network infrastructure has been fully in place and functional since the Spring of 1988.** The TNT backbone communications network links all of the BOCES Regional Information Centers and New York City with the Education Department. Standardized mainframe database software is installed in the BOCES Regional Information Centers, as well as the New York City Regional Information Center and the State Education Department. From each of the backbone sites, there are interconnections to all 41 BOCES and many school districts in each Regional Information Center area. **Work is continuing to allow all school districts presently networked to a BOCES to be connected to the TNT network, as well as to expand the number of districts direct connected or dialing-in to access the network.**
2. **The network infrastructure allows electronic communications via the PROFS system.** At the present time, **there are over 3,000 network users on the TNT PROFS system. This includes all 41 District Superintendents, many of the BOCES staff, and 150 school superintendents.** At the present time, staff are trained and using the network in over 250 school districts across the State. Recent electronic messages sent statewide from SED via PROFS include: proposed regulations, special bulletins from the Commissioner of Education, and a review of alternative Regents testing dates with District Superintendents and school superintendents. The use of the TNT Network by the Department will increase over the remainder of this year.
3. **The implementation of the network infrastructure has taken place down to the school building level in some districts.** For example, **the City of Buffalo has all 77 school buildings linked together.** The network allows the Buffalo superintendent to use PROFS to provide policy notices to all principals, as well as daily notices on school activities and educational issues. Likewise, **two New York City Community School Districts (#1 and #30) have all their buildings networked together.** Each of these districts has an electronic link into their respective Regional Information Centers, and have, therefore, communications access to all TNT network users in the State. This same network capacity allows districts to access a wide variety of management and instructional support services such as student information.
4. As part of the expansion of the TNT infrastructure, **a pilot project is underway between the Madison-Oneida Regional Information Center and the Mid-York Library to demonstrate the advantages of using the regional TNT network links for integrating both library and regular school district communications.** This pilot is operational, and will be expanded from the 4 sites presently involved.
5. In addition to the electronic messaging and document capability provided statewide through PROFS, an electronic conferencing capability has been put in place for selected Department and field based staff via the SED computer and the CoSy software. Furthermore, **the Madison-Oneida Regional Information Center for Instruction is now offering electronic conferencing (CoSy) capability statewide via TNT for a wide variety of educators.**
6. **The Department, as part of the Youth-at-Risk project, has established an electronic clearinghouse of information about resources, funding, research and programs that address the needs of students at risk.** This electronic clearinghouse is being built on the Education Department's computer, and is accessible to selected youth-at-risk coordinators across the State via TNT. During this next year the scope of information will grow, and the number of individuals who will have access to the information will increase.
7. **Regional conferences, jointly sponsored by the Education Department, the Regional Information Centers and the New York State Council of School Superintendents, are being held across the State.** The purpose of these conferences is to review the State direction for technology reflected in TNT, to review services being delivered and anticipated within the region, and to encourage local school district and regional planning for the implementation of technology in management, instructional support and instruction. In addition to the collaboration with the school superintendents, staff from the Department will be working closely with a wide number of other educational organizations and constituencies to reach consensus on a new paper that outlines the vision of the future for the use of technology in education for the next 5-10 years.

MANAGEMENT

1. **Financial (ST-3) and student (SA-129) data were electronically collected and transmitted to the State Education Department from a large number of districts (675 and 360 respectively) during the Fall of 1988.**
2. **During this Fall (1989) more districts will be included in the electronic data collection process, and additional groups of data will be collected.** One additional set of data to be collected electronically this year comes from the State Aid Projection form (SA-100). In this year's data collection effort, data from the prior year will be loaded into a PC-based program which will be provided to districts. After entry of this year's data, state aid projection reports can be generated by district staff and electronic records will be produced for transmittal to the Regional Information Centers. Once in the Regional Information Center the data can be directly accessed by SED.
3. **A new set of integrated financial applications is being developed at the Erie #1 BOCES for use across the State by BOCES and school districts.** The components of the system being tested now for release to the Regional Information Centers later this year include: **general ledger, revenue accounting, personnel and employee attendance.** The payroll component will be moved into test mode later this year. Other major components are also in development.

INSTRUCTIONAL SUPPORT

1. **The Student Information System became operational in New York City Community School District #1 on the first day of school (September, 1988).** The system presently includes biographical, demographic, program participation, medical, achievement and attendance components. Other major components are now under development, with the intent of making available a comprehensive student information system. **This same Student Information System has been implemented in Community District #30, and implementation is underway in Districts #19, #10 and #31 this school year.**
2. **The Student Information System is being extended and enhanced for implementation in other schools across the State through the Regional Information Centers.** A joint development team including New York City administrators, teachers and support staff has begun work with their counterparts upstate in the development and enhancement of the system.
3. **The Buffalo City School District is using the database software and query tools provided through the Erie #1 Regional Information Center on a regular basis to identify and track student attendance patterns in each school in Buffalo.** The TNT system also provides a vehicle for addressing questions related to court-ordered desegregation throughout the district.
4. **An integral part of the Student Information System is the Part 200 Management System for managing the programs of handicapped students. Approximately 100 districts have implemented the micro/mini version of the Part 200 System.** In addition, a mainframe version (2.0) is under test in the Buffalo City School District. This version can be linked with the other student components to provide a comprehensive, integrated student information system. In an attempt to assist districts in getting started with the data collection process and electronic reporting of data, as well as to facilitate training, the initial core version (1.0) of the Part 200 system will be tested this spring, and made available for the next school year. Development work on the Part 200 components will continue this year.

INSTRUCTION

1. **The Model Schools Program continues to work with teachers to demonstrate the integration of tool software (word processing, databases, spreadsheets and graphics) within the classroom.** A wide variety of tool-based lessons are being implemented by teachers in a number of disciplines.
2. **Over 2,500 teachers in the Model Schools area have been trained in the use of tool software within the classroom.** Applications in both management and instruction have been adopted across the disciplines.
3. **New instructional information services are being piloted with the new database software in the Model Schools project area.** At the present time 22 school districts are using the instructional information on the database. This service will be made available this year to all schools via the TNT network. Resource guides and a State K-6 syllabus in art were developed by art teachers via computer conferencing. The Model Schools teachers have also developed Autosketch, Fishertechnik and CAD/CAM training programs.
4. **Teachers in the Model Schools Program developed and are currently field testing technology-based extensions of CIMS science**

and math lessons which provide alternative learning experiences for special education and at-risk students in the CIMS programs.

5. **The Special Education Committee of the Model Schools project is providing computer hardware and software to special education students for use at home.** These students will use tool software and computer-based conferencing for instructional purposes.
6. **The CoSy computer-based conferencing system is now a Model Schools service for educators and students throughout the State.** This service will allow complete sharing and exchange of materials and information on specific educational issues to targeted groups interested in reducing isolation and improving resource coordination locally, regionally and Statewide.
7. **The TELECOM5 Educational Network has continued its collaborative planning for the delivery of integrated network services to the 77 school districts in five Southern Tier BOCES area.** In addition to planning, a regional telecommunications network for distance learning, the TELCOM5 project has delivered instructional and staff development services to schools throughout the area, including programs in sports medicine and teen stress.
8. In addition to an electronic Youth-At-Risk Clearinghouse being established for statewide access via TNT, **work is also in process on an AIDS clearinghouse for sharing information, curricula and effective programs.**

The Participants

Technology Network Ties is designed for the active participation of school districts, BOCES, libraries, other educational agencies and the State Education Department. Key service providers in the TNT effort will include:

State Education Department

Regional Information Centers (RIC's)

- Albany RIC
- Central New York RIC
- Lower Hudson RIC
- Mohawk RIC (Instructional)
- Monroe RIC
- Nassau RIC
- Southern Tier RIC
- Suffolk RIC
- Western New York RIC

Regional Computer Centers (RCC's)

- Finger Lakes RCC
- Mid-Hudson RCC
- Schuyler-Chemung RCC

Big Five Cities

- Buffalo
- New York City (RIC)
- Rochester
- Syracuse
- Yonkers

New York State Education Department

Office of Elementary and Secondary Planning, Testing and Technological Services
John J. Murphy, Assistant Commissioner
Division of Elementary and Secondary Planning and Development
Michael S. Radlick, Director

For Information Contact:

Denis J. Martin, Management Applications (518) 474-2380
Steven J. Kidder, Instructional Applications (518) 474-2380
Fred Demay, Part 200 Applications (518) 474-8917

LETTER OF AGREEMENT

A letter of agreement prepared by the Facilitator for the Superintendent is useful because it makes clear and explicit the expectations of all participants. The following is suggested for most letters of agreements for School District Information Study projects:

1. *Beginning and ending dates of study*
2. *Scope of study, what is included and what is excluded*
3. *Frequency and duration of meetings*
4. *Supporting resources*
   - *secretarial*
   - *rooms*
   - *duplicating*
   - *recordkeeping*
5. *Chain of communication*
6. *Special considerations*

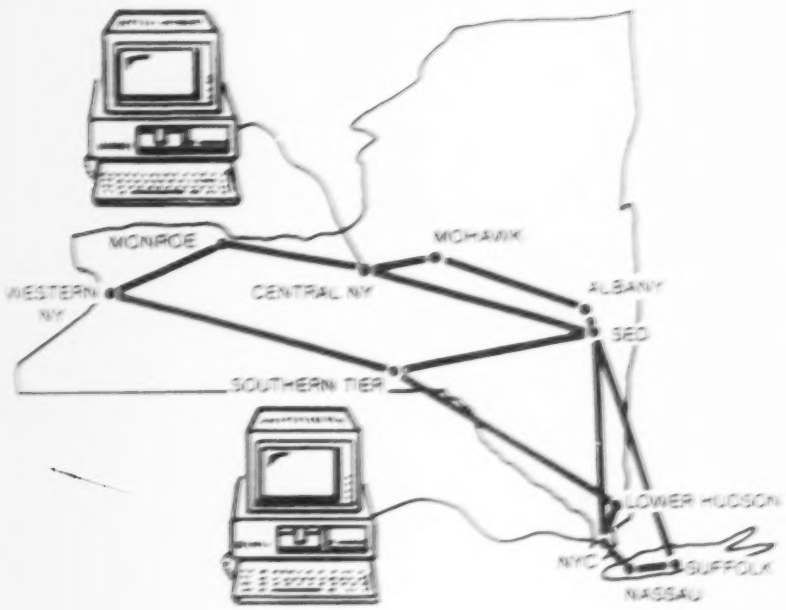
STUDY COMPONENTS DIAGRAM

STAGE			
I Planning (for data gathering)	A. Describing the Study Process to Interested School District(s)	B. Organizing the Study with Participating District	C. Planning for Data Gathering with District Study Team
II Development (of district needs & recommendation)	A. Gathering and Organizing School District Data	B. Analyzing and Specifying Problems of the School District	C. Developing Recommendations for Using Technology for the Management of Information
III Production of Plan	A. Writing a Summary Report on the Process and Findings of the Study	B. Producing an Implementation Plan based on the Summary Report	Presenting the Final Report and Implementation Plan to Various Audiences
IV Implementation of Plan	A. Implementing the Plan	B. Monitoring and Evaluating	

APPENDIX 6

STATEWIDE NETWORK INFRASTRUCTURE

STATEWIDE NETWORK INFRASTRUCTURE



A SYSTEM FOR GENERATING SOLUTIONS AND MAXIMIZING RESOURCES

TECHNOLOGY NETWORK TIES

POLICIES FOR STATEWIDE INFORMATION SYSTEMS

Adopted by the
Board of Regents
January 1989

The Regents recognize the critical need for planning in the uses of technology for management of school programs and the delivery of instruction. Therefore, the Regents adopt the following policy:

> The Regents support the position that planning for the use of technology is critical to facilitate the management of school districts and to utilize the computer in the support of instruction. (Instructional support involves the use of information technology for making decisions about students, but not the use of technology for the direct instruction of students.) School districts must initiate and sustain a coordinated planning effort in order to effectively use technology. This planning must examine all existing hardware and software, existing sources of funding, and the relationship of these with the curriculum objectives of the district. Planning must focus on instructional support, including using student information to examine the objectives of the district and examine the cost-effective application of technology to curriculum support. The focus must not be on the technology itself.

RATIONALE FOR THIS POLICY: Planning is the process of defining desirable future situations and then identifying effective methods and approaches for bringing that future into being. The planning process includes: clarity of mission and goals; information about the past and present situation, including representative descriptions of strengths and weaknesses (needs); good forecasts of future trends and the anticipated organizational and external environment; and assessment of available resources and commitments. Because of the strategic importance of information, the rapidly changing technological environment, the substantial cost for implementing technology systems, and the tremendous negative impact that the lack of planning will produce, the Regents and the Department need to establish the clear need for technology planning. School district planning must address the use of technology.

The Regents recognize the crucial importance of a common, integrated database of student and school building information; and a statewide network with standards for allowing access and sharing of information. Therefore, the Regents adopt the following policy:

> The Regents support the database and network standards established within Technology Network Ties and the Student Information System component as the foundation upon which the educational decision-making system is to be built. The establishment of these standards is a critical State role and reflects the need of the State to insure that consistent information is available in the most cost-effective manner possible.

RATIONALE FOR THIS POLICY: Two prerequisites for making decisions are: (1) a common, integrated database of student and school building information, along with a telecommunication network with appropriate standards for providing flexible access and (2) a sharing of information statewide. Through the work of Technology Network Ties and the Student Information System, which is being conducted in the BOCES Regional Information Centers and the Big Five Cities, the establishment of this database and network are underway. It makes good economic and strategic sense to build on the infrastructure already in place to establishing common, statewide database and network and to support decision-making at all levels.

The Regents recognize the critical importance of information for decision making. Therefore, the Regents adopt the following policy:

> The Regents support the position that the appropriate use of technology can substantially enhance schools' ability to support management and instructional decision-making. Teachers and administrators must have reliable, accurate and timely information about all their students. This information must be available to those authorized to use the information in ways that make it easy to analyze both individual student progress through the curriculum, as well as the success of various groups of students whose progress is aggregated by either student or program characteristics. The Regents endorse the Technology Network Ties/Student Information System as the method to provide more information to teachers and administrators, via technology tools that support decision-making.

RATIONALE FOR THIS POLICY: Reliable, accurate and timely information is important for appropriate instructional placement of students, delivery of instruction, determination of program success, and the formulation of policy. Information system development and implementation must be focused on the critical need for decision-making because they address instructional delivery, program accountability, and empowerment of administrators and teachers with the information necessary for program decision-making. State-level information for policy development is expected to be a by-product of good local information systems.

The Regents recognize the need for individual student data for state policy-making, as well as the importance of security and confidentiality of such information. Therefore, the Regents adopt the following policy:

The Regents have a responsibility to insure that all students in New York State are being equitably educated in a manner that guarantees that minimum standards are met. In order to have a means to support the Regents' and Department's accountability for the equitable treatment of students across the State, a wide variety of individual student demographic and performance data needs to be monitored on a regular basis. The Regents direct that the Department move to collect this information electronically through Technology Network Ties and to make it accessible to the Department through the TNT network.

The Regents are aware of the need to balance the rights of individual students to privacy and the confidentiality of information about students with the Regents responsibilities to insure equity. The State Legislature continues to require the Department to collect additional student achievement and performance data in order to provide a basis for determining whether all students in the State receive an equitable distribution of educational program resources. These requirements, along with the Regents existing responsibility for program accountability, necessitate that a statewide student database, with the individual student as the unit of analysis, must be available to the Department. The Regents, therefore, endorse the collection of individual pupil information via the Technology Network Ties/Student Information System.

The Regents reaffirm the importance of information system security to restrict access to individual pupil information solely

to those authorized for such information. Furthermore, the Regents maintain the need to preserve the confidentiality of all students. In order to establish and maintain security and confidentiality, the Regents direct the Department to establish and promulgate guidelines and procedures related to the use of existing and future information systems. Furthermore, the Regents support the prosecution, to the full extent of the law, of any individual or group that accesses or uses information in an unauthorized manner, or any individual or group that uses information systems (or the information they contain) for either personal gain or in a malicious or destructive way.

RATIONALE FOR THIS POLICY: In order to insure that all levels of the State system have the information necessary for program decision-making, it is critical that detailed data about individual students be available for analysis and reporting through Technology Network Ties and the Student Information System. In order to insure that the goals of both equity and excellence are met, this data must include gender and ethnic information, in addition to other student demographic and achievement data. The key to this information must be each student's unique identification number. In most cases, it is neither necessary nor allowable for the Department to actually examine individual student records without obtaining the requisite parental authorization. What is necessary is the Department's ability to analyze a wide variety of groupings of student data, some of which cannot be easily defined prior to the analysis. Fortunately, the technology established in Technology Network Ties provides a means for individual student data to be included in the TNT database in a way that establishes a level of security that restricts the Department to using applications that generate aggregate information based on individual student data. Furthermore, the State TNT database will never include individual student names, but rather only student identification numbers. To preserve confidentiality and insure security, the Department will only be able, where allowable, to examine individual student information using the student ID number, not names.

MISSION STATEMENT

A mission statement defines the purpose of the group. The mission should be related to the charge given to the group by the Superintendent, and should be three to five sentences long. The mission statement should be written by the District Study Team so that they internalize what they are trying to accomplish and will be able to articulate their purpose to colleagues, and the public. Some examples of mission statements follows.

Mission

To assess and develop a district-wide system for the technological management of information.

Mission

To assess the current status of, and determine future directions for, the use of computer technology for management functions in the school district.

Mission

To develop a plan for the use of computers to process information and enhance informed decision making by management.

LIST OF FUNCTIONAL GROUPS

Name of groups:

1 _____	*11* _____
2 _____	*12* _____
3 _____	*13* _____
4 _____	*14* _____
5 _____	*15* _____
6 _____	*16* _____
7 _____	*17* _____
8 _____	*18* _____
9 _____	*19* _____
10 _____	*20* _____

Use this form to identify the various groups to be interviewed. It is suggested that while groups be clearly identified, some clustering will be necessary for various reasons such as size of district, duration of interviews, etc. For example, in a small district the principals might be interviewed as one group. In a larger district they might be grouped as elementary, middle school, and secondary.

PLACING INDIVIDUALS IN FUNCTIONAL GROUPS

Use this Form to assign individuals to a group for interviewing.

Group _____

1.
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Group _____

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Group _____

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QUESTIONNAIRE

NAME _____ POSITION _____

The following questionnaire is designed to help the district determine the kind and amount of information being processed within the context of your specific job. Check those categories which apply to your job.

Student Information

Directory Information (name, address parent name, etc.) _____

School Attendance _____

Emergency Information _____

Medical _____

Bus Numbers & Routes _____

Student Schedule (incl. homeroom) _____

Special Education _____

RCT Status _____

Standardized Test Data _____

Summer School _____

Honors/Awards _____

Transfer Data _____

Past School Record _____

Report Cards _____

List of Credits _____

Class Rank ____

Transcript (academic record) ____

Discipline, Class Attendance ____

In-School Suspension ____

Out-of-School Suspension ____

Athletic Eligibility ____

Participation in Student Activities (clubs, athletics, stud. govt., etc.) ____

Out-of-School Activities ____

Lockers ____

Other (specify)

_____ ____

Personnel Information

Personnel Record ____

Staff Development ____

Appraisal ____

Attendance ____

Staff Directory ____

Primary Assignment ____

Extra-Curricular Assignment ____

Years of Experience ____

Seniority List ____

Certification Status ____

Employment History _____

Current Salary _____

Salary History _____

Graduate Degrees _____

Graduate Hours _____

Retirement System _____

Health Benefits _____

Employment Status _____

Employee Group _____

Group Contact Language _____

Curriculum Work _____

In-service Courses _____

Summer School Employment _____

Substitute Employee Lists _____

Applicant Information _____

conference Attendance _____

Date of Birth _____

Business Office

Inventory Control _____

Purchasing _____

Cash Management _____

Budget Development _____

Accounts Payable _____

Budget Status Reports _____

Petty Cash _____

Buildings & Grounds _____

Work Order Processing _____

Preventive Maintenance Control _____

Energy Management _____

Supplies & Equipment Inventory _____

Utility Usage/Cost _____

Transportation

Bus Routes _____

Bus Assignments _____

Fleet Maintenance _____

Parts Inventory _____

Vehicle Inventory _____

Special Transportation Arrangements _____

Food Service

Inventory _____

Free Lunch Matters _____

Menu Planning _____

Financial Records _____

Payroll

Input Data _____

Payroll Reports _____

Payroll Schedule _____

Time Records _____

Substitute Reports _____

Communications

Within Your School/Department _____

With Central Office _____

With Other Schools/Departments _____

Outside The System _____

APPENDIX 12

S.D.I.S. Interview Questions

DISTRICT: _____

GROUP: _____

DATE: _____

TIME: _____

1. *What problems do you experience with the current flow of information in, through, and out of your area?*

2. *What recommendations do you have for improving the flow of information in and out of your area?*

3. *What training needs do you think you will have?*

4. *If you could wish for one thing to help you handle information better, what would that be?*

5. *Is there anything else you wish to see addressed?*

SUMMARY OF STEPS LEADING TO THE DEVELOPMENT OF RECOMMENDATIONS

The following five steps are used to develop recommendations related to the problem statements obtained through the interviews.

STEP 1 PROBLEM STATEMENTS

The following are examples of problem statements related to information management obtained. These are collected from each functional group interviewed.

- o"Information presently is kept by hand - too much duplication of effort."
- o"We need Lotus 1-2-3."
- o"We need instant access to records currently kept by paper/pencil method."
- o"There is a lack of workshops for secretaries to develop skills in word processing and other software."
- o"In-house record keeping needs refinement."
- o"Software for population projections is not available."
- o"Too many card files for too many items is inefficient."
- o"Student health data is not current."
- o"Communications between buildings is slow."
- o"We need to be able to transfer SA-100 information to SED via Lotus 1-2-3."

STEP 2 AREAS OF CONCERN

The problem statements are categorized into broad areas of concern such as: (training and staff development, centralized database, hardware, software, procedures, etc.) For example statements related to software are taken from the list above and placed under that concern.

CONCERN: Software

- o"Information presently is kept by hand-too much duplication of effort."
- o"We need Lotus 1-2-3."
- o"We need instant access to records currently kept by paper/pencil methods."
- o"In-house record keeping needs refinement."
- o"Software for population projections is not available."
- o"Student health data is not current."
- o"We need to be able to transfer SA-100 information to SED via Lotus 1-2-3."

STEP III ISSUES

Within each broad area of concern a further refinement is made by identifying issues based upon the statements of problems. Supporting statements of problems are grouped with each issue. The following is one example.

CONCERN: Software

ISSUE: Spreadsheet Software

- "We need Lotus 1-2-3."
- "In-house record keeping needs refinement."
- "Software for population projections is not available."
- We need to be able to transfer SA-100 information to SED via Lotus 1-2-3.

STEP IV ANALYSIS OF ISSUES AND PROBLEM STATEMENTS

The problem statements supporting each issue within each area of concern are analyzed. A summary statement of the analysis is then written. For the example above:

ANALYSIS: There needs to be an efficient method to enable forecasting and planning by allowing for a "what if" component, which is provided through spreadsheet software.

STEPS V RECOMMENDATIONS

Following the consensus regarding the written analysis statement the group discusses various means of resolving the problems and reaches consensus on a recommendations for the issue. For the preceding issue, spreadsheet software, an example of such a recommendation would be:

RECOMMENDATION: The Study Group recommends that the district standardize on LOTUS 1-2-3 for spreadsheet applications.

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